



211050011U2CorrectedSeq.TXT

SEQUENCE LISTING

<110> Peter S.N.Rowe

<120> REGULATION OF TISSUE MINERALIZATION AND  
PHOSPHATE METABOLISM BY ASARM PEPTIDES

<130> 21105.0011U2

<140> 10/567938

<141> 2006-07-13

<150> PCT/us04/30530

<151> 2003-09-19

<160> 37

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 19

<212> PRT

<213> Homo sapien

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Arg Asp Asp Ser Ser Glu Ser Ser Asp Ser Gly Ser Ser Ser Glu Ser  
1 5 10 15

Asp Gly Asp

<210> 2

<211> 18

<212> PRT

<213> Mus musculus

<400> 2

Arg Asp Ser Ser Glu Ser Ser Ser Ser Gly Ser Ser Ser Glu Ser His  
1 5 10 15

Gly Asp

<210> 3

<211> 18

<212> PRT

<213> Rattus norvegicus

<400> 3

Arg Asp Ser Ser Glu Ser Ser Ser Ser Gly Ser Ser Ser Glu Ser Ser  
1 5 10 15

Gly Asp

<210> 4

<211> 24

<212> PRT

<213> Homo sapien

<400> 4

Phe Ser Ser Arg Arg Arg Asp Asp Ser Ser Glu Ser Ser Asp Ser Gly  
1 5 10 15

Ser Ser Ser Glu Ser Asp Gly Asp  
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Cys Phe Ser Ser Arg Arg Arg Asp Asp Ser Ser Glu Ser Ser Asp Ser  
1 5 10 15  
Gly Ser Ser Ser Glu Ser Asp Gly Asp  
20 25

<210> 6  
<211> 26  
<212> PRT  
<213> Homo sapien

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Cys Gly Ser Gly Tyr Thr Asp Leu Gln Glu Arg Gly Asp Asn Asp Ile  
1 5 10 15  
Ser Pro Phe Ser Gly Asp Gly Gln Pro Phe  
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Ala Pro Thr Phe Gln  
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<210> 8  
<211> 5  
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<400> 8  
Asp Ser Glu Ser Ser  
1 5

<210> 9  
<211> 5  
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<400> 9  
Ser Ser Ser Glu Ser  
1 5

<210> 10  
<211> 15  
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211050011U2CorrectedSeq.TXT

<400> 10

Ala Pro Thr Phe Gln Pro Gln Thr Glu Lys Thr Lys Gln Ser Cys  
1 5 10 15

<210> 11

<211> 19

<212> PRT

<213> Homo sapien

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Thr Asp Leu Gln Glu Arg Gly Asp Asn Asp Ile Ser Pro Phe Ser Gly  
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Asp Gly Gln

<210> 12

<211> 19

<212> PRT

<213> Homo sapien

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Gly Arg Gln Pro His Ser Asn Arg Arg Phe Ser Ser Arg Arg Arg Asp  
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Asp Ser Ser

<210> 13

<211> 18

<212> PRT

<213> Homo sapien

<400> 13

Asp Asp Ser Ser Glu Ser Ser Asp Ser Gly Ser Ser Ser Glu Ser Asp  
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Gly Asp

<210> 14

<211> 19

<212> PRT

<213> Homo sapien

<220>

<221> VARIANT

<222> 12,14,16

<223> Xaa = a phosphorylated serine

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Arg Asp Asp Ser Ser Glu Ser Ser Asp Ser Gly Xaa Ser Xaa Glu Xaa  
1 5 10 15

Asp Gly Asp

<210> 15

<211> 25

<212> PRT

<213> Homo sapien

<400> 15

Gly Ser Gly Tyr Thr Asp Leu Gln Glu Arg Gly Asp Asn Asp Ile Ser

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1          5          10          15
Pro Phe Ser Gly Asp Gly Gln Pro Phe
20          25

<210> 16
<211> 19
<212> PRT
<213> Macaca fascicularis

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1          5          10          15
Asp Gly Asp

<210> 17
<211> 525
<212> PRT
<213> Homo sapien

<400> 17
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20          25          30
Glu Glu Gln Arg Gln Glu Glu Lys Asn Lys Asp Asn Ile Gly Phe His
35          40          45
His Leu Gly Lys Arg Ile Asn Gln Glu Leu Ser Ser Lys Glu Asn Ile
50          55          60
Val Gln Glu Arg Lys Lys Asp Leu Ser Leu Ser Glu Ala Ser Glu Asn
65          70          75          80
Lys Gly Ser Ser Lys Ser Gln Asn Tyr Phe Thr Asn Arg Gln Arg Leu
85          90          95
Asn Lys Glu Tyr Ser Ile Ser Asn Lys Glu Asn Thr His Asn Gly Leu
100          105          110
Arg Met Ser Ile Tyr Pro Lys Ser Thr Gly Asn Lys Gly Phe Glu Asp
115          120          125
Gly Asp Asp Ala Ile Ser Lys Leu His Asp Gln Glu Glu Tyr Gly Ala
130          135          140
Ala Leu Ile Arg Asn Asn Met Gln His Ile Met Gly Pro Val Thr Ala
145          150          155          160
Ile Lys Leu Leu Gly Glu Glu Asn Lys Glu Asn Thr Pro Arg Asn Val
165          170          175
Leu Asn Ile Ile Pro Ala Ser Met Asn Tyr Ala Lys Ala His Ser Lys
180          185          190
Asp Lys Lys Lys Pro Gln Arg Asp Ser Gln Ala Gln Lys Ser Pro Val
195          200          205
Lys Ser Lys Ser Thr His Arg Ile Gln His Asn Ile Asp Tyr Leu Lys
210          215          220
His Leu Ser Lys Val Lys Lys Ile Pro Ser Asp Phe Glu Gly Ser Gly
225          230          235          240
Tyr Thr Asp Leu Gln Glu Arg Gly Asp Asn Asp Ile Ser Pro Phe Ser
245          250          255
Gly Asp Gly Gln Pro Phe Lys Asp Ile Pro Gly Lys Gly Glu Ala Thr
260          265          270
Gly Pro Asp Leu Glu Gly Lys Asp Ile Gln Thr Gly Phe Ala Gly Pro
275          280          285
Ser Glu Ala Glu Ser Thr His Leu Asp Thr Lys Lys Pro Gly Tyr Asn
290          295          300
Glu Ile Pro Glu Arg Glu Glu Asn Gly Gly Asn Thr Ile Gly Thr Arg
305          310          315          320

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211050011U2CorrectedSeq.TXT

Asp	Glu	Thr	Ala	Lys	Glu	Ala	Asp	Ala	Val	Asp	Val	Ser	Leu	Val	Glu
				325					330					335	
Gly	Ser	Asn	Asp	Ile	Met	Gly	Ser	Thr	Asn	Phe	Lys	Glu	Leu	Pro	Gly
			340					345					350		
Arg	Glu	Gly	Asn	Arg	Val	Asp	Ala	Gly	Ser	Gln	Asn	Ala	His	Gln	Gly
		355					360					365			
Lys	Val	Glu	Phe	His	Tyr	Pro	Pro	Ala	Pro	Ser	Lys	Glu	Lys	Arg	Lys
	370					375					380				
Glu	Gly	Ser	Ser	Asp	Ala	Ala	Glu	Ser	Thr	Asn	Tyr	Asn	Glu	Ile	Pro
385					390					395					400
Lys	Asn	Gly	Lys	Gly	Ser	Thr	Arg	Lys	Gly	Val	Asp	His	Ser	Asn	Arg
				405					410					415	
Asn	Gln	Ala	Thr	Leu	Asn	Glu	Lys	Gln	Arg	Phe	Pro	Ser	Lys	Gly	Lys
			420					425					430		
Ser	Gln	Gly	Leu	Pro	Ile	Pro	Ser	Arg	Gly	Leu	Asp	Asn	Glu	Ile	Lys
		435					440					445			
Asn	Glu	Met	Asp	Ser	Phe	Asn	Gly	Pro	Ser	His	Glu	Asn	Ile	Ile	Thr
	450					455					460				
His	Gly	Arg	Lys	Tyr	His	Tyr	Val	Pro	His	Arg	Gln	Asn	Asn	Ser	Thr
465					470					475					480
Arg	Asn	Lys	Gly	Met	Pro	Gln	Gly	Lys	Gly	Ser	Trp	Gly	Arg	Gln	Pro
				485					490					495	
His	Ser	Asn	Arg	Arg	Phe	Ser	Ser	Arg	Arg	Arg	Asp	Asp	Ser	Ser	Glu
			500					505					510		
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<210> 18  
 <211> 433  
 <212> PRT  
 <213> Mus musculus

<400> 18

Met	Gln	Ala	Val	Ser	Val	Gly	Leu	Leu	Leu	Phe	Ser	Met	Thr	Trp	Ala
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Ala	Pro	Met	Pro	Asn	Glu	Asp	Arg	Ser	Ser	Cys	Gly	Asn	Gln	Asp	Ser
			20					25					30		
Ile	His	Lys	Asp	Leu	Ala	Ala	Ser	Val	Tyr	Pro	Asp	Pro	Thr	Val	Asp
		35					40					45			
Glu	Gly	Thr	Glu	Asp	Gly	Gln	Gly	Ala	Leu	Leu	His	Pro	Pro	Gly	Gln
	50					55					60				
Asp	Arg	Tyr	Gly	Ala	Ala	Leu	Leu	Arg	Asn	Ile	Thr	Gln	Pro	Val	Lys
65					70					75					80
Ser	Leu	Val	Thr	Gly	Ala	Glu	Leu	Arg	Arg	Glu	Gly	Asn	Gln	Glu	Lys
			85						90					95	
Arg	Pro	Gln	Ser	Val	Leu	Ser	Val	Ile	Pro	Ala	Asp	Val	Asn	Asp	Ala
			100					105					110		
Lys	Val	Ser	Leu	Lys	Asp	Ile	Lys	Asn	Gln	Glu	Ser	Tyr	Leu	Leu	Thr
		115					120					125			
Gln	Ser	Ser	Pro	Val	Lys	Ser	Lys	His	Thr	Lys	His	Thr	Arg	Gln	Thr
	130					135					140				
Arg	Arg	Ser	Thr	His	Tyr	Leu	Thr	His	Leu	Pro	Gln	Ile	Lys	Lys	Thr
145					150					155					160
Pro	Ser	Asp	Leu	Glu	Gly	Ser	Gly	Ser	Pro	Asp	Leu	Leu	Val	Arg	Gly
			165						170					175	
Asp	Asn	Asp	Val	Pro	Pro	Phe	Ser	Gly	Asp	Gly	Gln	His	Phe	Met	His
			180					185					190		
Ile	Pro	Gly	Lys	Gly	Gly	Ala	Gly	Ser	Gly	Pro	Glu	Ser	Ser	Thr	Ser
		195					200					205			
Arg	Pro	Leu	Ser	Gly	Ser	Ser	Lys	Ala	Glu	Val	Ile	Asp	Pro	His	Met
	210					215						220			
Ser	Gly	Leu	Gly	Ser	Asn	Glu	Ile	Pro	Gly	Arg	Glu	Gly	His	Gly	Gly

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225          230          235          240
Ser Ala Tyr Ala Thr Arg Asp Lys Ala Ala Gln Gly Ala Gly Ser Ala
245          250          255
Gly Gly Ser Leu Val Gly Gly Ser Asn Glu Ile Thr Gly Ser Thr Asn
260          265          270
Phe Arg Glu Leu Pro Gly Lys Glu Gly Asn Arg Ile Asn Ala Gly Ser
275          280          285
Gln Asn Ala His Gln Gly Lys Val Glu Phe His Tyr Pro Gln Val Ala
290          295          300
Ser Arg Glu Lys Val Lys Gly Gly Val Glu His Ala Gly Arg Ala Gly
305          310          315          320
Tyr Asn Glu Ile Pro Lys Ser Ser Lys Gly Ser Ser Ser Lys Asp Ala
325          330          335
Glu Glu Ser Lys Gly Asn Gln Leu Thr Leu Thr Ala Ser Gln Arg Phe
340          345          350
Pro Gly Lys Gly Lys Ser Gln Gly Pro Ala Leu Pro Ser His Ser Leu
355          360          365
Ser Asn Glu Val Lys Ser Glu Glu Asn His Tyr Val Phe His Gly Gln
370          375          380
Asn Asn Leu Thr Pro Asn Lys Gly Met Ser Gln Arg Arg Gly Ser Trp
385          390          395          400
Pro Ser Arg Arg Pro Asn Ser His Arg Arg Ala Ser Thr Arg Gln Arg
405          410          415
Asp Ser Ser Glu Ser Ser Ser Ser Gly Ser Ser Ser Glu Ser His Gly
420          425          430
Asp

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&lt;210&gt; 19

&lt;211&gt; 435

&lt;212&gt; PRT

&lt;213&gt; Rattus norvegicus

&lt;400&gt; 19

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Met Gln Ala Val Ser Val Gly Leu Phe Leu Phe Ser Met Thr Trp Ala
1          5          10          15
Ala Pro Lys Leu Asn Glu Asp Gly Ser Ser Gly Gly Asn Gln Gly Asn
20          25          30
Ile His Leu Ala Ser Val Lys Pro Glu Pro Met Val Gly Lys Gly Thr
35          40          45
Glu Gly Gly Arg Asp Ala Pro Leu His Leu Leu Asp Gln Asn Arg Gln
50          55          60
Gly Ala Thr Leu Leu Arg Asn Ile Thr Gln Pro Val Lys Ser Leu Val
65          70          75          80
Thr Gly Thr Glu Val Gln Ser Asp Arg Asn Lys Glu Lys Lys Pro Gln
85          90          95
Ser Val Leu Ser Val Ile Pro Thr Asp Val His Asn Thr Asn Asp Tyr
100          105          110
Ser Glu Asp Thr Glu Asn Gln Gln Arg Asp Leu Leu Leu Gln Asn Ser
115          120          125
Pro Gly Gln Ser Lys His Thr Pro Arg Ala Arg Arg Ser Thr His Tyr
130          135          140
Leu Thr His Leu Pro Gln Ile Arg Lys Ile Leu Ser Asp Phe Glu Asp
145          150          155          160
Ser Ala Ser Pro Asp Leu Leu Val Arg Gly Asp Asn Asp Val Pro Pro
165          170          175
Phe Ser Gly Asp Gly Gln His Phe Met His Thr Pro Asp Arg Gly Gly
180          185          190
Ala Val Gly Ser Asp Pro Glu Ser Ser Ala Gly His Pro Val Ser Gly
195          200          205
Ser Ser Asn Val Glu Ile Val Asp Pro His Thr Asn Gly Leu Gly Ser
210          215          220
Asn Glu Ile Pro Gly Arg Glu Gly His Ile Gly Gly Ala Tyr Ala Thr

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211050011U2CorrectedSeq.TXT

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225      230      235      240
Arg Gly Lys Thr Ala Gln Gly Ala Gly Ser Ala Asp Val Ser Leu Val
      245      250      255
Glu Gly Ser Asn Glu Ile Thr Gly Ser Thr Lys Phe Arg Glu Leu Pro
      260      265      270
Gly Lys Glu Gly Asn Arg Val Asp Ala Ser Ser Gln Asn Ala His Gln
      275      280      285
Gly Lys Val Glu Phe His Tyr Pro Gln Ala Pro Ser Lys Glu Lys Val
      290      295      300
Lys Gly Gly Ser Arg Glu His Thr Gly Lys Ala Gly Tyr Asn Glu Ile
305      310      315      320
Pro Lys Ser Ser Lys Gly Gly Ala Ser Lys Asp Ala Glu Glu Ser Lys
      325      330      335
Gly Asn Gln Val Thr Leu Thr Glu Ser Gln Arg Phe Pro Gly Lys Gly
      340      345      350
Lys Gly Gln Ser Ser His Ser Leu Gly Asn Glu Val Lys Ser Glu Glu
      355      360      365
Asp Ser Ser Asn Ser Leu Ser Arg Glu Gly Ile Ala Ile Ala His Arg
      370      375      380
Arg Thr Ser His Pro Thr Arg Asn Arg Gly Met Ser Gln Arg Arg Gly
385      390      395      400
Ser Trp Ala Ser Arg Arg Pro His Pro His Arg Arg Val Ser Thr Arg
      405      410      415
Gln Arg Asp Ser Ser Glu Ser Ser Ser Ser Gly Ser Ser Ser Glu Ser
      420      425      430
Ser Gly Asp
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<210> 20

<211> 555

<212> PRT

<213> Macaca fascicularis

<400> 20

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Met Arg Val Phe Cys Val Gly Leu Leu Phe Leu Ser Val Thr Trp Ala
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      20      25      30
Glu Glu Gln Arg Ile Thr Tyr Lys Gly His His Glu Lys His Gly His
      35      40      45
Tyr Val Phe Lys Cys Val Tyr Met Ser Pro Gly Lys Lys Asn Gln Thr
      50      55      60
Asp Val Lys Gln Glu Glu Lys Asn Lys Asp Asn Ile Gly Leu His His
65      70      75      80
Leu Gly Lys Arg Arg Tyr Gln Glu Leu Ser Ser Lys Glu Asn Ile Val
      85      90      95
Gln Glu Arg Lys Lys Asp Leu Ser Leu Ser Glu Ala Gly Glu Asn Asn
      100      105      110
Gly Ser Ser Lys Ser Gln Asn Tyr Phe Thr Asn Arg Gln Arg Leu Asn
      115      120      125
Lys Glu Tyr Ser Ile Ser Asn Lys Glu Asn Ile His Asn Gly Leu Arg
      130      135      140
Met Ser Ile Tyr Pro Lys Ser Thr Gly Asn Lys Gln Phe Ala Asp Gly
145      150      155      160
Asp Asp Ala Ile Ser Glu Leu His Asp Gln Glu Glu Tyr Gly Ala Ala
      165      170      175
Leu Ile Arg Asn Asn Met Gln His Ile Met Gly Pro Val Thr Ala Ile
      180      185      190
Lys Leu Leu Gly Glu Glu Asn Lys Gln Ser Lys Pro Lys Asn Val Leu
      195      200      205
Asn Lys Ile Pro Ala Ser Met Asn Tyr Ala Lys Ala His Ser Lys Asp
      210      215      220
Lys Lys Lys Pro Gln Arg Asp Ser Gln Val Gln Lys Val Pro Val Lys

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## 211050011U2CorrectedSeq.TXT

225					230					235					240
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Leu	Ser	Lys	Val	Lys	Lys	Ile	Pro	Ser	Asp	Phe	Glu	Gly	Ser	Gly	Tyr
			260						265					270	
Thr	Asp	Leu	Gln	Glu	Arg	Gly	Asp	Asn	Asp	Met	Ser	Pro	Phe	Ser	Gly
		275					280						285		
Asp	Gly	Gln	Pro	Phe	Lys	Asp	Ile	Pro	Gly	Lys	Gly	Glu	Ala	Thr	Gly
	290					295					300				
Ser	Asp	Leu	Glu	Gly	Lys	Asp	Ile	Gln	Thr	Gly	Phe	Ala	Gly	Pro	Ser
305					310					315				320	
Glu	Ala	Glu	Ser	Thr	Asn	Leu	Asp	Thr	Lys	Glu	Pro	Gly	Tyr	Asn	Glu
				325					330					335	
Ile	Pro	Glu	Arg	Lys	Glu	Asn	Gly	Gly	Asn	Thr	Ile	Gly	Thr	Gly	Asp
			340					345					350		
Glu	Thr	Ala	Lys	Glu	Ala	Asp	Ala	Val	Asp	Val	Ser	Leu	Val	Glu	Gly
		355					360					365			
Asn	Asn	Asp	Ile	Met	Gly	Ser	Thr	Asn	Phe	Lys	Glu	Leu	Pro	Gly	Arg
	370					375					380				
Glu	Gly	Asn	Arg	Val	Asp	Val	Gly	Gly	Gln	Asn	Ala	His	Gln	Gly	Lys
385					390					395				400	
Val	Glu	Phe	His	Tyr	Pro	Pro	Ala	Pro	Ser	Lys	Glu	Lys	Arg	Lys	Glu
			405						410					415	
Gly	Ser	Ser	Asp	Ala	Thr	Glu	Ser	Thr	Asn	Tyr	Asn	Glu	Ile	Pro	Lys
			420					425					430		
Asn	Asp	Lys	Gly	Ser	Ala	Arg	Lys	Gly	Val	Asp	Asp	Ser	Asn	Arg	Asn
	435						440					445			
Gln	Ala	Ile	Leu	His	Glu	Lys	Gln	Arg	Phe	Pro	Ser	Lys	Gly	Lys	Ser
	450					455						460			
Gln	Gly	Leu	Pro	Ile	Pro	Ser	Arg	Gly	Leu	Asp	Asn	Glu	Ile	Lys	Thr
465					470					475				480	
Glu	Met	Asp	Ser	Leu	Asn	Gly	Pro	Ser	Asn	Glu	Asn	Ile	Pro	His	Ser
			485						490					495	
Arg	Lys	Tyr	His	Tyr	Val	Pro	His	Arg	Gln	Asn	Asn	Pro	Thr	Arg	Asn
			500					505					510		
Lys	Gly	Met	Pro	His	Gly	Lys	Gly	Ser	Trp	Gly	Arg	Gln	Pro	Tyr	Ser
	515						520					525			
Asn	Arg	Arg	Leu	Ser	Ser	Arg	Arg	Arg	Glu	Asp	Ser	Ser	Glu	Ser	Ser
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Asp	Ser	Gly	Ser	Ser	Ser	Glu	Ser	Asp	Gly	Asp					
545					550					555					

&lt;210&gt; 21

&lt;211&gt; 165

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;221&gt; VARIANT

&lt;222&gt; 1

&lt;223&gt; Xaa = T or M

&lt;220&gt;

&lt;221&gt; VARIANT

&lt;222&gt; 2-4

&lt;223&gt; Xaa = Any amino acid except Lys

&lt;220&gt;

&lt;221&gt; VARIANT

&lt;222&gt; 6

&lt;223&gt; Xaa = Y or S



<220>  
 <221> VARIANT  
 <222> 11  
 <223> Xaa = E or G

<220>  
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 <223> Xaa = E or K

<220>  
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 <223> Xaa = Any amino acid except Lys

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 <223> Xaa = G or I

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 <223> Xaa = Any amino acid except Lys

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 <223> Xaa = Any amino acid except Lys

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 <223> Xaa = Any amino acid except Lys

<400> 21  
 Xaa Xaa Xaa Xaa Gly Xaa Asn Glu Ile Pro Xaa Arg Xaa Xaa Xaa Xaa  
 1 5 10 15

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Xaa	Gly	Xaa	Xaa	Xaa	Xaa	Thr	Arg	Asp	Glu	Thr	Ala	Xaa	Xaa	Ala	Asp
		20						25					30		
Ala	Val	Asp	Val	Ser	Leu	Val	Glu	Gly	Ser	Asn	Asp	Ile	Met	Gly	Ser
		35					40					45			
Thr	Asn	Phe	Lys	Glu	Leu	Pro	Gly	Arg	Glu	Gly	Asn	Arg	Val	Asp	Ala
	50					55					60				
Gly	Ser	Gln	Asn	Ala	His	Gln	Gly	Lys	Val	Glu	Phe	His	Tyr	Pro	Xaa
65					70					75				80	
Ala	Pro	Ser	Lys	Glu	Lys	Arg	Lys	Glu	Gly	Ser	Xaa	Xaa	Xaa	Xaa	Xaa
			85						90				95		
Xaa	Xaa	Xaa	Tyr	Asn	Glu	Ile	Pro	Lys	Xaa	Xaa	Lys	Gly	Xaa	Xaa	Xaa
			100				105					110			
Lys	Xaa	Xaa	Xaa	Xaa	Ser	Asn	Arg	Asn	Gln	Ala	Thr	Leu	Asn	Glu	Lys
		115				120						125			
Gln	Arg	Phe	Pro	Ser	Lys	Gly	Lys	Ser	Gln	Gly	Leu	Pro	Ile	Pro	Ser
	130					135					140				
Arg	Gly	Leu	Asp	Asn	Glu	Ile	Lys	Asn	Glu	Met	Asp	Ser	Phe	Asn	Gly
145					150					155					160
Pro	Ser	His	Glu	Asn											
				165											

<210> 22  
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 <212> PRT  
 <213> Homo sapien

<220>  
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 <223> Xaa = Y or S

<220>  
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 <223> Xaa = E or G

<220>  
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 <223> Xaa = E or K

<220>  
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 <222> 9-11  
 <223> Xaa = Any amino acid except Lys

<220>  
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 <222> 12  
 <223> Xaa = G or I

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 Xaa Asn Glu Ile Pro Xaa Arg Xaa Xaa Xaa Xaa Gly  
 1 5 10

<210> 23  
 <211> 11  
 <212> PRT  
 <213> Homo sapien

<220>

<221> VARIANT

<222> 7-8

<223> Xaa=Any Amino Acid except Lys

<220>

<221> VARIANT

<222> 11

<223> Xaa = S or G

<400> 23

Tyr Asn Glu Ile Pro Lys Xaa Xaa Lys Gly Xaa  
1 5 10

<210> 24

<211> 57

<212> PRT

<213> Homo sapien

<220>

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<222> 46

<223> Xaa = P or Q

<400> 24

Asp Val Ser Leu Val Glu Gly Ser Asn Asp Ile Met Gly Ser Thr Asn  
1 5 10 15  
Phe Lys Glu Leu Pro Gly Arg Glu Gly Asn Arg Val Asp Ala Gly Ser  
20 25 30  
Gln Asn Ala His Gln Gly Lys Val Glu Phe His Tyr Pro Xaa Ala Pro  
35 40 45  
Ser Lys Glu Lys Arg Lys Glu Gly Ser  
50 55

<210> 25

<211> 44

<212> PRT

<213> Homo sapien

<400> 25

Asn Lys Gly Met Pro Gln Gly Lys Gly Ser Trp Gly Arg Gln Pro His  
1 5 10 15  
Ser Asn Arg Arg Phe Ser Ser Arg Arg Asp Asp Ser Ser Glu Ser  
20 25 30  
Ser Asp Ser Gly Ser Ser Ser Glu Ser Asp Gly Asp  
35 40

<210> 26

<211> 44

<212> PRT

<213> Mus musculus

<400> 26

Asn Lys Gly Met Ser Gln Arg Arg Gly Ser Trp Pro Ser Arg Arg Pro  
1 5 10 15  
Asn Ser His Arg Arg Ala Ser Thr Arg Gln Arg Asp Ser Ser Glu Ser  
20 25 30  
Ser Ser Ser Gly Ser Ser Ser Glu Ser His Gly Asp  
35 40

211050011U2CorrectedSeq.TXT

<210> 27

<211> 44

<212> PRT

<213> Rattus norvegicus

<400> 27

Asn	Arg	Gly	Met	Ser	Gln	Arg	Arg	Gly	Ser	Trp	Ala	Ser	Arg	Arg	Pro
1				5					10					15	
His	Pro	His	Arg	Arg	Val	Ser	Thr	Arg	Gln	Arg	Asp	Ser	Ser	Glu	Ser
			20					25					30		
Ser	Ser	Ser	Gly	Ser	Ser	Ser	Glu	Ser	Ser	Gly	Asp				
			35				40								

<210> 28

<211> 39

<212> PRT

<213> Homo sapien

<400> 28

Ser	Gln	Ser	Glu	Glu	Ser	His	Ser	Glu	Glu	Asp	Asp	Ser	Asp	Ser	Gln
1				5					10					15	
Asp	Ser	Ser	Arg	Ser	Lys	Glu	Asp	Ser	Asn	Ser	Thr	Glu	Ser	Lys	Ser
			20					25					30		
Ser	Ser	Glu	Glu	Asp	Gly	Gln									
			35												

<210> 29

<211> 40

<212> PRT

<213> Homo sapien

<400> 29

Pro	Gln	Gly	Lys	Gly	Ser	Trp	Gly	Arg	Gln	Pro	His	Ser	Asn	Arg	Arg
1				5					10					15	
Phe	Ser	Ser	Lys	Arg	Arg	Asp	Asp	Ser	Ser	Glu	Ser	Ser	Asp	Ser	Gly
			20					25					30		
Ser	Ser	Ser	Glu	Ser	Asp	Gly	Asp								
			35				40								

<210> 30

<211> 41

<212> PRT

<213> Mus musculus

<400> 30

Ser	Gln	Arg	Arg	Gly	Ser	Trp	Pro	Ser	Arg	Arg	Pro	Asn	Ser	His	Arg
1				5					10					15	
Arg	Ala	Ser	Thr	Arg	Arg	Gln	Arg	Asp	Ser	Ser	Glu	Ser	Ser	Ser	Ser
			20					25					30		
Gly	Ser	Ser	Ser	Glu	Ser	His	Gly	Asp							
			35				40								

<210> 31

<211> 40

<212> PRT

<213> Rattus norvegicus

<400> 31

Ser	Gln	Arg	Arg	Gly	Ser	Trp	Ala	Ser	Arg	Arg	Pro	His	Pro	His	Arg
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

## 211050011U2CorrectedSeq.TXT

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1           5           10           15
Arg Val Ser Thr Arg Gln Arg Asp Ser Ser Glu Ser Ser Ser Ser Gly
      20      25      30
Ser Ser Ser Glu Ser Ser Gly Asp
      35      40

```

<210> 32  
 <211> 36  
 <212> PRT  
 <213> Homo sapien

```

<400> 32
Met Lys Phe Leu Val Phe Ala Phe Ile Leu Ala Leu Met Val Ser Met
1           5           10           15
Ile Gly Ala Asp Ser Ser Glu Glu Lys Phe Leu Arg Arg Ile Gly Arg
      20      25      30
Phe Gly Tyr Gly
      35

```

<210> 33  
 <211> 180  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Homo sapien

```

<400> 33
Gln Thr Gly Phe Ala Gly Pro Ser Glu Ala Glu Ser Thr His Leu Asp
1           5           10           15
Thr Lys Lys Pro Gly Tyr Asn Glu Ile Pro Glu Arg Glu Glu Asn Gly
      20      25      30
Gly Asn Thr Ile Gly Thr Arg Asp Glu Thr Ala Lys Phe Ala Asp Ala
      35      40      45
Val Asp Val Ser Leu Val Glu Gly Ser Asn Asp Ile Met Gly Ser Thr
      50      55      60
Asn Phe Lys Glu Leu Pro Gly Arg Glu Gly Asn Arg Val Asp Ala Gly
      65      70      75      80
Ser Gln Asn Ala His Gln Gly Lys Val Glu Glu His Tyr Pro Pro Ala
      85      90      95
Pro Ser Lys Glu Lys Arg Lys Glu Gly Ser Ser Asp Ala Ala Glu Ser
      100     105     110
Thr Asn Tyr Asn Glu Ile Pro Lys Asn Gly Lys Gly Ser Thr Arg Lys
      115     120     125
Gly Val Asp His Ser Asn Arg Asn Gln Ala Thr Leu Asn Glu Lys Gln
      130     135     140
Arg Phe Pro Ser Lys Gly Lys Ser Gln Gly Leu Pro Ile Pro Ser Arg
      145     150     155     160
Gly Leu Asp Asn Glu Ile Lys Asn Leu Met Asp Ser Phe Asn Gly Pro
      165     170     175
Ser His Glu Asn
      180

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<210> 34  
 <211> 180  
 <212> PRT  
 <213> Macaca fascicularis

<400> 34

## 211050011U2CorrectedSeq.TXT

Gln Thr Gly Phe Ala Gly Pro Ser Glu Ala Glu Ser Thr Asn Leu Asp  
 1 5 10 15  
 Ile Lys Phe Pro Gly Tyr Asn Phe Ile Pro Phe Arg Lys Phe Asn Gly  
 20 25 30  
 Gly Asn Thr Ile Gly Thr Gly Asp Glu Thr Ala Lys Ile Phe Ala Asp  
 35 40 45  
 Ala Val Asp Val Ser Leu Val Glu Gly Asn Asn Asp Ile Met Gly Ser  
 50 55 60  
 Thr Asn Phe Lys Glu Leu Pro Gly Arg Glu Gly Asn Arg Val Asp Val  
 65 70 75 80  
 Gly Gly Gln Asn Ala His Gln Gly Lys Val Glu Phe His Tyr Pro Pro  
 85 90 95  
 Ala Pro Ser Lys Glu Lys Arg Lys Glu Gly Ser Ser Asp Ala Thr Glu  
 100 105 110  
 Ser Thr Asn Tyr Asn Glu Ile Pro Lys Asn Asp Lys Gly Ser Ala Arg  
 115 120 125  
 Lys Gly Val Asp Asp Ser Asn Arg Asn Gln Ala Ile Leu His Glu Lys  
 130 135 140  
 Gln Arg Phe Pro Ser Lys Gly Lys Ser Gln Gly Leu Pro Ile Pro Ser  
 145 150 155 160  
 Arg Gly Leu Asp Asn Glu Ile Lys Thr Glu Met Asp Ser Leu Asn Gly  
 165 170 175  
 Pro Ser Asn Glu  
 180

<210> 35  
 <211> 169  
 <212> PRT  
 <213> Mus musculus

<400> 35  
 Arg Pro Leu Ser Gly Ser Ser Lys Ala Glu Val Ile Asp Pro His Met  
 1 5 10 15  
 Ser Gly Leu Gly Ser Asn Glu Ile Pro Gly Arg Glu Gly His Gly Gly  
 20 25 30  
 Ser Ala Tyr Ala Thr Arg Asp Lys Ala Ala Gln Gly Ala Gly Ser Ala  
 35 40 45  
 Gly Gly Ser Leu Val Gly Gly Ser Asn Glu Ile Ile Gly Ser Thr Asn  
 50 55 60  
 Phe Arg Glu Leu Pro Gly Lys Glu Gly Asn Arg Ile Asn Ala Gly Ser  
 65 70 75 80  
 Gln Asn Ala His Gln Gly Lys Val Glu Phe His Tyr Pro Gln Val Ala  
 85 90 95  
 Ser Arg Glu Lys Val Lys Gly Gly Val Glu His Ala Gly Arg Ala Gly  
 100 105 110  
 Tyr Asn Glu Ile Pro Lys Ser Ser Lys Gly Ser Ser Ser Lys Asp Ala  
 115 120 125  
 Glu Glu Ser Lys Gly Asn Gln Leu Thr Leu Thr Ala Ser Gln Arg Phe  
 130 135 140  
 Pro Gly Lys Gly Lys Ser Gln Gly Pro Ala Leu Pro Ser His Ser Leu  
 145 150 155 160  
 Ser Asn Glu Val Lys Ser Glu Glu Asn  
 165

<210> 36  
 <211> 169  
 <212> PRT  
 <213> Rattus norvegicus

<400> 36  
 Arg Pro Leu Ser Gly Ser Ser Lys Ala Glu Val Ile Asp Pro His Met

## 211050011U2CorrectedSeq.TXT

```

1           5           10           15
Ser Gly Leu Gly Ser Asn Glu Ile Pro Gly Arg Glu Gly His Gly Gly
20          25          30
Ser Ala Tyr Ala Thr Arg Asp Lys Ala Ala Gln Gly Ala Gly Ser Ala
35          40          45
Gly Gly Ser Leu Val Gly Gly Ser Asn Glu Ile Ile Gly Ser Thr Asn
50          55          60
Phe Arg Glu Leu Pro Gly Lys Glu Gly Asn Arg Ile Asn Ala Gly Ser
65          70          75          80
Gln Asn Ala His Gln Gly Lys Val Glu Phe His Tyr Pro Gln Val Ala
85          90          95
Ser Arg Glu Lys Val Lys Gly Gly Val Glu His Ala Gly Arg Ala Gly
100         105         110
Tyr Asn Glu Ile Pro Lys Ser Ser Lys Gly Ser Ser Ser Lys Asp Ala
115         120         125
Glu Glu Ser Lys Gly Asn Gln Leu Thr Leu Thr Ala Ser Gln Arg Phe
130         135         140
Pro Gly Lys Gly Lys Ser Gln Gly Pro Ala Leu Pro Ser His Ser Leu
145         150         155         160
Ser Asn Glu Val Lys Ser Glu Glu Asn
165

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&lt;210&gt; 37

&lt;211&gt; 179

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Note =  
Synthetic Construct

&lt;220&gt;

&lt;221&gt; VARIANT

<222> 1-2,4-5,7,9,12-16,18-20,22,27,30-31,34-37,41,44-45,47-49,  
56,58,60,66,71,94,101,103,106-113,120-121,125-126,128-131,  
133-134,137,140,142,147,159-160,162,165,167,169,172,177

&lt;223&gt; Xaa=Any Amino Acid

&lt;400&gt; 37

```

Xaa Xaa Gly Xaa Xaa Gly Xaa Ser Xaa Ala Glu Xaa Xaa Xaa Xaa Xaa
1           5           10           15
Ile Xaa Xaa Xaa Gly Xaa Asn Glu Ile Pro Xaa Arg Glu Xaa Xaa Gly
20          25          30
Gly Xaa Xaa Xaa Xaa Thr Arg Asp Xaa Thr Ala Xaa Xaa Ala Xaa Xaa
35          40          45
Xaa Val Ser Leu Val Glu Gly Xaa Asn Xaa Ile Xaa Gly Ser Ile Asn
50          55          60
Phe Xaa Leu Leu Pro Gly Xaa Glu Gly Asn Arg Val Asp Asp Gly Ser
65          70          75          80
Gln Asn Ala His Gln Gly Lys Val Phe Phe His Tyr Pro Xaa Ala Pro
85          90          95
Ser Lys Glu Lys Xaa Lys Xaa Gly Ser Xaa Xaa Xaa Xaa Xaa Xaa Xaa
100         105         110
Xaa Tyr Asn Glu Ile Pro Lys Xaa Xaa Lys Gly Ser Xaa Xaa Lys Xaa
115         120         125
Xaa Xaa Xaa Ser Xaa Xaa Asn Gln Xaa Thr Leu Xaa Glu Xaa Gln Arg
130         135         140
Phe Pro Xaa Lys Gly Lys Ser Gln Gly Ile Pro Ile Pro Ser Xaa Xaa
145         150         155         160
Leu Xaa Asn Glu Xaa Lys Xaa Glu Xaa Asp Ser Xaa Asn Gly Pro Ser
165         170         175
Xaa Glu Asn

```

211050011U2CorrectedSeq.TXT